Preliminary Investigations for Replacing Reclamation Fish Release Sites

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Summary

For several years there has been considerable focus and discussion on the performance of fish release sites used by the U.S. Bureau of Reclamation (Reclamation) and California Department of Water Resources (DWR). Reclamation and DWR each maintain and operate two or three separate fish release sites at different locations on the Sacramento River. The state and federal release sites are similar in concept, yet all release sites are unique and possess different operating conditions. Fish survival during and following the release process has been the topic of several biological studies. Fish survival is dependent on both biological and hydraulic parameters associated with the release process. In 2008 DWR conducted a biological and hydraulic assessment of the California state water project fish release sites (Miranda and Padilla 2010). The DWR study evaluated fish survival and hydraulic performance of a DWR release site using a physical hydraulic model and a three-dimensional computational fluid dynamics (CFD) model of the release facility. The study identified several hydraulic issues associated with design and operation of state water project release sites that resulted in improvement actions. After the DWR sites were evaluated, Technical Service Center (TSC) researchers began evaluating the Reclamation sites. Midway into the evaluations, failure of the Antioch fish release site required temporary site changes. This proposal seeks funding to conduct preliminary investigations for permanent fixes or replacement of Reclamation's fish release sites that will improve fish survival when released.

Problem Statement

In FY 2011 a project was funded to evaluate Reclamation's fish salvage release sites. At the time the proposal was written it was assumed that the depths, slopes, and lengths of the fish release sites were known. Unfortunately design drawings and specifications provided little insight to actual site geometries. Tracy Fish Collection Facility (TFCF) personnel were able to obtain the lengths of the current pipes but during the process discovered that the Antioch site had many holes along its bottom that needed to be fixed. From the early stages of the evaluation TSC researchers were convinced that the hydraulics of the pipeline were not adequate for sweeping fish and debris from the pipe. Evaluations would have determined the necessary additional flow required to sweep the debris from the pipe. However, midway into the evaluations temporary changes were made to fix the Antioch site so that it would be in a working condition. During the same time that the Antioch site was in need of repair the Ematon site was inoperable due to electrical problems. Completing this study will develop fish release site fixes or replacement that will provide stable and save fish releases from TFCF delivery trucks.

Goals and Hypotheses

Goals:

1. Determine the best permanent fixes that will provide stable and save fish releases from TFCF delivery trucks. This may include retrofits or complete replace.

Hypotheses:

1. If retrofits or replacement of the fish release sites are possible, then fish survival during releases will increase.

Materials and Methods

Results from the DWR and Reclamation fish release site evaluations will be utilized to develop retrofits or redesigns for the Reclamation fish release sites. Design practices followed by the TSC will be incorporated including assistance with the design from mechanical and electrical engineers.

Coordination and Collaboration

The study will be coordinated between the TSC, Mid-Pacific Region, and TFCF staffs and the interagency Tracy Technical Advisory Team through regular updates and meetings.

Endangered Species Issues

This study will not require permitting.

Dissemination of Results (Deliverables and Outcomes)

Once preliminary designs are completed, a presentation of any possible options will be presented to TFCF personnel. Once a design is selected, the process of releasing a specification package with design and constructions drawings will begin.